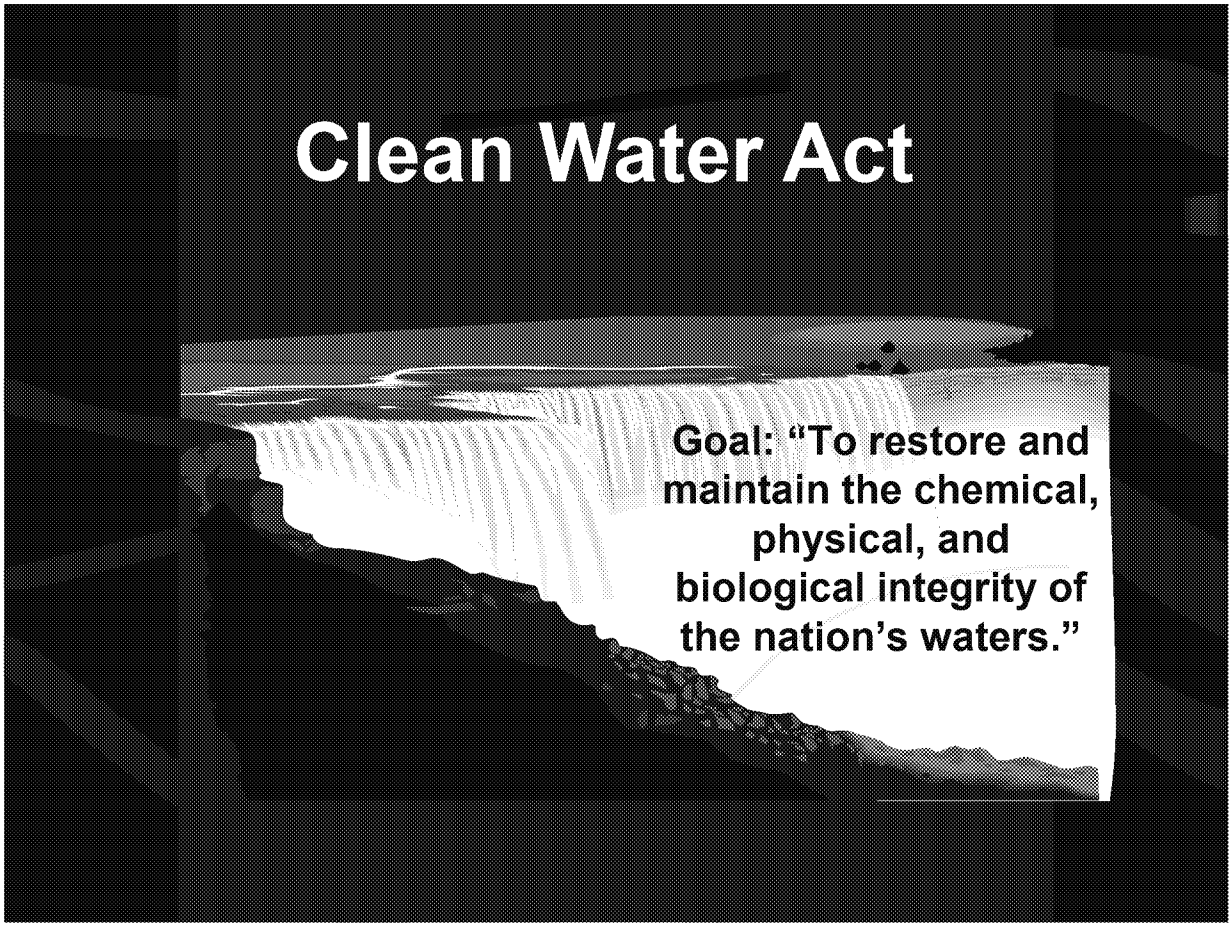
Clean Water Act (CWA) NPDES Permits

April 6, 2017

Clean Water Act



Goal: "To restore and maintain the chemical, physical, and biological integrity of the nation's waters."

Clean Water Act

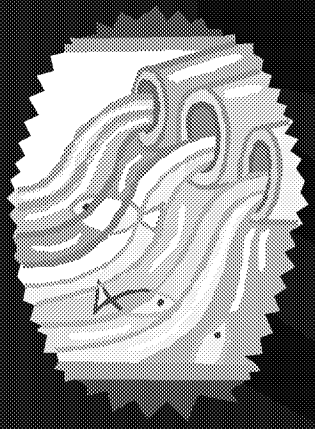
Promulgated in 1972 / Amended in 1987

- Sec 301(a): Except as in compliance with this section and sections 302, 306, 307, 318, 402 and 404 of this Act, the discharge of any pollutant by any person shall be unlawful.
  - CWA Section 301 requires a permit for the discharge of pollutants to waters of the United States
  - Discharging without a permit would be a violation of this section of the CWA

Section 402 is the NPDES Permitting Program

What is NPDES?

- National Pollutant Discharge Elimination System
- A permit is a license
  - Issued by the EPA or, once authorized, a tribe or a state
  - Granting permission/controlling point source discharges of pollutants into waters of the US
  - A permit is a privilege not a right



Section 402 of the CWA

Either EPA or a state/tribal government with the delegation authority to administer the NPDES Program under the CWA:

- Develops permits with technology or water-quality based limits (the more stringent of either)
- Issues permits to dischargers
- Tracks permit compliance
- Conducts compliance inspections
- Takes enforcement actions

State/Tribal role during CWA § 401 Certification

Permit must comply with WQS

Who Needs a Permit?

All "point sources" discharging "pollutants" into "waters of the U.S."

Must obtain an NPDES permit from EPA or an authorized state* or tribe

* States are not authorized to write permits on tribal lands

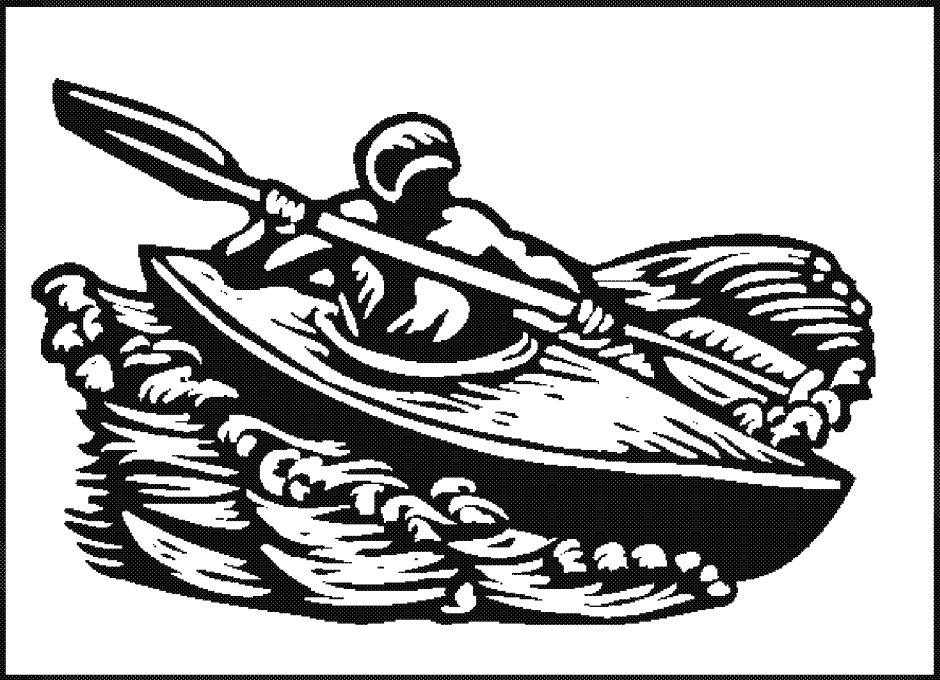
Definition of Point Source

Point source means any discernable, confined, and discrete conveyance, including but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, landfill leachate collection system, vessel or other floating craft from which pollutants are or may be discharged

Definition of a Pollutant

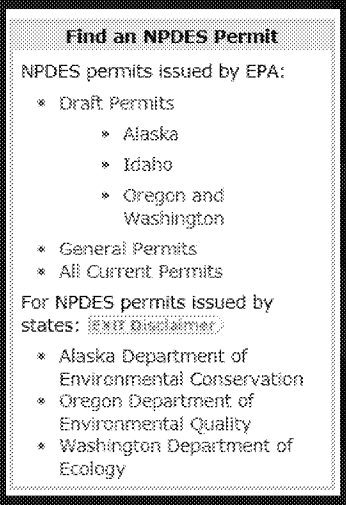
Pollutant means dredged spoil, solid waste, incinerator residue, sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials, radioactive materials, heat, wrecked or discarded equipment, rock, sand, cellar dirt and industrial, municipal, and agricultural waste discharged into water

Waters of the US



Types of Permits

- Individual Permit
- General Permit

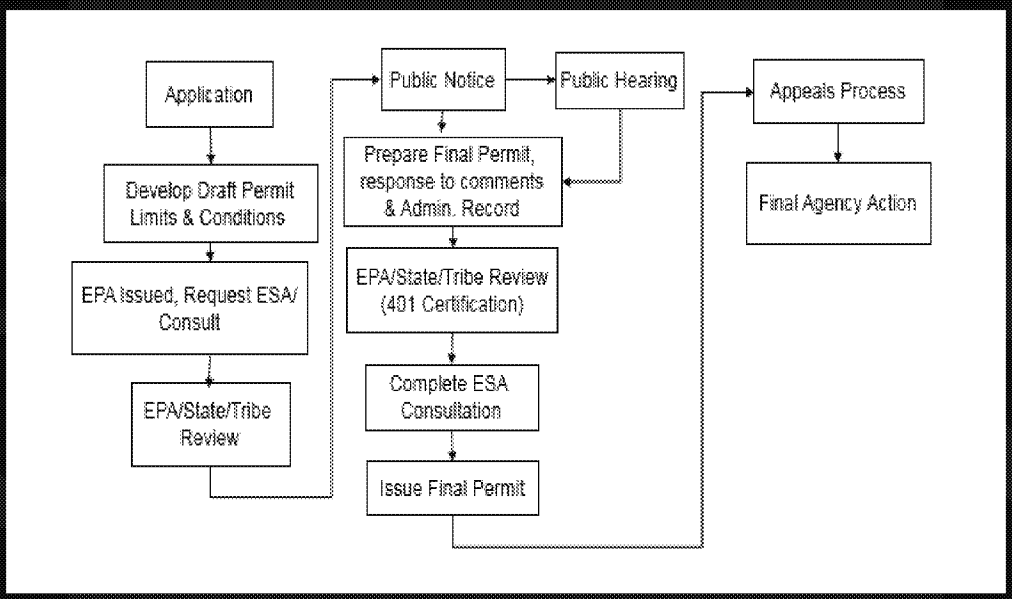


https://yosemite.epa.gov/r10/WATER.NSF/NPDES+Permits/Permits+Homepage

Individual Permit

- For a single applicant
- Permit valid for 5 years
- Examples –
  - Municipal WWTP
  - Single Industrial Facility

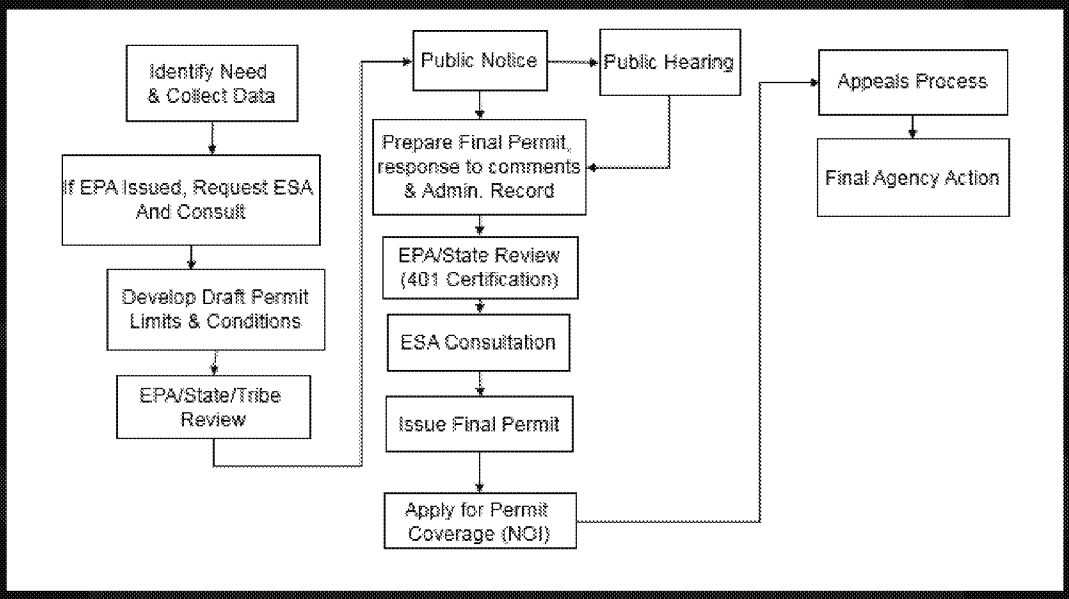
Individual Permit Process



General Permit

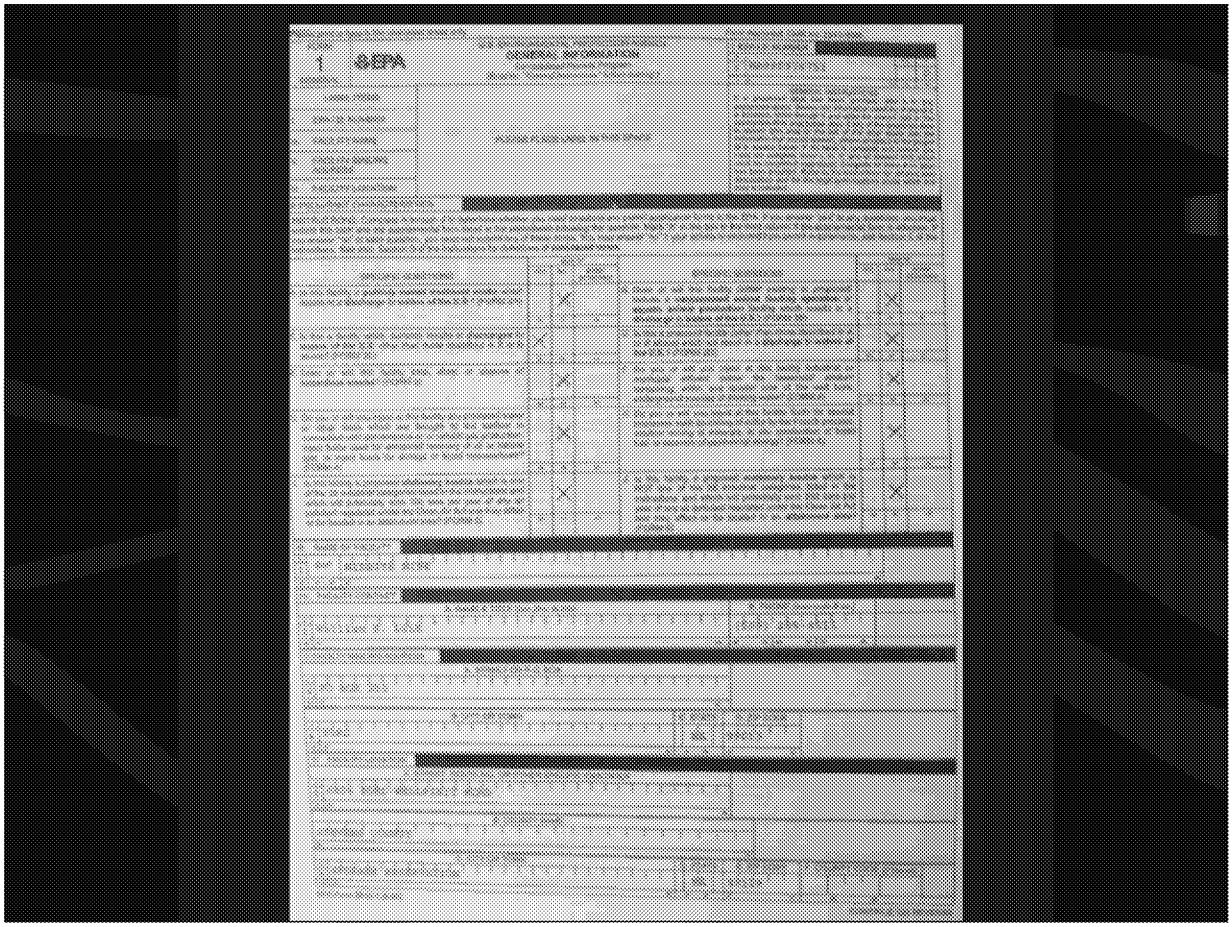
- Available to several applicants
- Only one permit issued, valid for 5 years
- For a specific category of activity (mining, stormwater, seafood, oil and gas, etc.)
- Same geographical area (statewide, watershed)

General Permit Process



Permit Process

- **Permit Application**
- Draft Permit & Fact Sheet
- Public Notice
- Public Hearing?
- Response to Comments
- Issue Permit
- Appeal?



Permit Process

- Permit Application
- **Draft Permit & Fact Sheet**
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Content of NPDES Permits

- **Effluent Limits**
- Monitoring
- Reporting
- Record Keeping
- Special Conditions
- Standard Conditions

Technology-based Effluent Limitations

- Purpose
  - Establish minimum level of pollutant controls for all point source dischargers
    - Conventional pollutants
      - BOD, TSS, fecal coliform, pH, and oil and grease
    - Priority (toxic) pollutants
    - Non-conventional pollutants
      - not identified as either conventional or priority
      - e.g., Chlorine, ammonia, nitrogen, phosphorus
  - Provide equity among dischargers within industrial categories

EPA can define a pollutant as conventional. The original list did not include oil and grease, it was added later.

Technology-based Effluent Limitations (cont)

- National technology-based standards are available - Effluent Limitations Guidelines (ELGs)
- Technology-based requirements implemented through NPDES permits: regulations are not self-implementing
- In the absence of National standards
  - Develop on a case-by-case basis (BPJ) based on 40 CFR 125.3

Secondary Treatment Standards

- 40 CFR § 133
- Applicable to Publicly Owned Treatment Works (POTWs)
- Implemented in NPDES permits
- BOD_5 and TSS
  - 30/45 with 85% removal
- pH within the range of 6 – 9 su
- Equivalent to Secondary: BOD_5 and TSS
  - 45/65 with 65% removal

Types of Limitations

- Production
  - Based on how much is produced
- Concentration
  - Based on mass per volume discharged
- Mass Loading
  - Calculation based on concentration and volume discharged (Secondary Treatment)

Water Quality-based Effluent Limitations

Water quality based limitations are used when it has been determine that more stringent limits than technology-based effluent limits must be applied to a discharge in order to protect the designated use of the receiving water.

Non-detectable Standards

- When determining a standard that will not impact aquatic organisms, the results may be extrapolated below the detection limit of current laboratory methods
- The permit has to contain a limit based on the WQS but a compliance level will be included in the permit

Non-detectable Standards
DMR Reporting

For a Single Value	Report
less than the MDL	"less than {numeric value of the MDL}"
between the MDL and the ML	"less than {numeric value of the ML}"
For Monthly Averages	**Use or Report**
less than the MDL	zero may be assigned
between the MDL and the ML	the {numeric value of the MDL} may be assigned
if the average value is less than the ML	"less than {numeric value of the MDL}"
between the MDL and the ML	"less than {numeric value of the ML}"
equal to or greater than the ML	Actual numeric value

Reasonable Potential

40 CFR 122.44(d)(i) - Limitations must control ***all pollutants or pollutant parameters*** (either conventional, nonconventional, or toxic pollutants) which the Director determines are or may be discharged at a level which ***will cause, have the reasonable potential to cause, or contribute to an excursion*** above any State water quality standard, including State narrative criteria for water quality.

Reasonable Potential

40 CFR 122.44(d)(ii) - When determining whether a discharge causes, has the reasonable potential to cause, or contributes to an in-stream excursion above a narrative or numeric criteria within a State water quality standard, the permitting authority shall use procedures which ***account for existing controls*** on point and nonpoint sources of pollution, the ***variability*** of the pollutant or pollutant parameter in the effluent, the sensitivity of the species to toxicity testing (when evaluating whole effluent toxicity), and where appropriate, the ***dilution of the effluent*** in the receiving water.

Standard to Limit - 1

- Waste Load Allocation
  - Aquatic Life Criteria
    - Acute
    - Chronic
  - Human Health Criteria
    - Organisms only
    - Water and organisms

Any mixing zone considered here

Standard to Limit - 2

- Long Term Average – acute & chronic

$$LTA_{a,c} = WLA_{a,c} \bullet e^{[0.5\sigma^2 - z\sigma]}$$

where $\sigma^2 = \ln(CV^2+1)$
z = 1.645 for 95th percentile probability basis, and
z = 2.326 for 99th percentile probability basis

$$LTA_c = WLA_c \bullet e^{[0.5\sigma_4^2 - z\sigma_4]}$$

where $\sigma_4^2 = \ln(CV^2/4 + 1)$
z = 1.645 for 95th percentile probability basis, and
z = 2.326 for 99th percentile probability basis

- Use lower LTA

Standard to Limit – 3 Aquatic Life

$$MDL = LTA \bullet e^{[z\sigma - 0.5\sigma^2]}$$

where $\sigma^2 = \ln(CV^2+1)$
$z = 1.645$ for 95th percentile probability basis, and
$z = 2.326$ for 99th percentile probability basis

$$AML = LTA \bullet e^{[z\sigma_n - 0.5\sigma_n^2]}$$

where $\sigma_n^2 = \ln(CV^2/n + 1)$
$z = 1.645$ for 95th percentile probability basis, and
$z = 2.326$ for 99th percentile probability basis

Standard to Limit – 4 Human Health

- Set the Average Monthly Limit (AML) equal to the WLA
- Calculate the Maximum Daily Limit (MDL)

$$\frac{MDL}{AML} = \frac{\exp\left[z_m\sigma - 0.5\sigma^2\right]}{\exp\left[z_a\sigma_n - 0.5\sigma_n^2\right]}$$

where

$\sigma_n^2 = \ln(CV^2/n + 1)$

$\sigma^2 = \ln(CV^2 + 1)$

CV = the coefficient of variation of the effluent concentration

n = the number of samples per month

z_m = the percentile exceedance probability for the MDL

z_a = the percentile exceedance probability for the AML.

Content of NPDES Permit

- Effluent Limits
- **Monitoring**
- **Reporting**
- **Record Keeping**
- Special Conditions
- Standard Conditions

Monitoring

- Frequencies are based on the nature and effect of a pollutant, as well as a determination of the minimum sampling necessary to adequately monitor the facility's performance.
- Permittees have the option of taking more frequent samples than required by the permit.
- These samples must be included in calculations and used for averaging if they are conducted using appropriate test methods.

Monitoring

- Monitoring records must include:
  - the date, exact place, and time of sampling or measurements
  - the name(s) of the individual(s) who performed the sampling or measurements;
  - the date(s) analyses were performed;
  - the names of the individual(s) who performed the analyses;
  - the analytical techniques or methods used; and
  - the results of such analyses.

Field

Lab

Sampling

- Representative sample of influent?
  - Nothing specified in most permits
- Grab
  - Adequate if effluent quality is consistent
- Composite
  - Necessary if effluent quality varies
  - Time proportionate
    - Specific sample volume taken every x hours
  - Flow proportionate
    - Specific sample volume taken every x gallons
    - Varying sample volume taken every x hours

Reporting

- Type of reporting
  - Discharge Monitoring Reports (DMR)
  - Annual Report
    - Summary of annual data in addition to DMRs
    - One report under a GP instead of DMRs
- Frequency of submission
  - Monthly
  - Quarterly
  - Annually
  - Never??

Records

- Generation
  - DMRs
  - Required Plans (QAP, BMP, O&M)
- On-site retention
  - 40 CFR 122.41(j)(2) says “at least 3 years”
  - Most permits will say 5 years
- Are the Plans being followed?
- Do the Plans reflect current conditions?

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Special Conditions
+ Quality Assurance Plan
+ Best Management Practices Plan
+ Special Studies
+ Compliance Schedule
+ Operation and Maintenance Plan
+ Emergency Response and Public Notification Plan
+ Toxic Management Plan

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Standard Conditions

§ 122.41 Conditions applicable to all permits

"The following conditions apply to all NPDES permits. Additional conditions applicable to NPDES permits are in § 122.42."

§ 122.42 Additional conditions applicable to specified categories of NPDES permits.

Representative Sampling

- 40 CFR 122.41(j)(1) states

Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity.

Twenty-four Hour Notice of Noncompliance Reporting

40 CFR 122.41(l)(6) requires the permittee to report the following occurrences of noncompliance by telephone within 24 hours from the time the permittee becomes aware of the circumstances:

- any noncompliance that may endanger health or the environment;
- any unanticipated bypass that exceeds any effluent limitation in the permit;
- any upset that exceeds any effluent limitation in the permit; or
- *any violation of a maximum daily discharge limitation for applicable pollutants listed by the Director in the permit*

Bypass

- means the intentional diversion of waste streams from any portion of a treatment facility

Upset

- Means an exceptional incident in which there is unintentional and temporary noncompliance with *technology-based permit effluent limitations* because of factors beyond the reasonable control of the permittee.
- An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.

Proper Operations and Maintenance

- 40 CFR 122.41(e) states

The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of this permit.

Proper O & M (cont)

- Includes adequate laboratory controls and appropriate quality assurance procedures.
- Requires the operation of backup or auxiliary facilities or similar systems which are installed by a permittee only when the operation is necessary to achieve compliance with the conditions of the permit
  - Does not require installation of backup or auxiliary facilities

Calibration

- *Guidance for Quality Assurance Project Plans* (EPA/QA/G-5)
- Ensure continual quality performance of any equipment and instruments.
- List any equipment and instruments needing calibration
- Field equipment: pumps, flow meters, gauges, pH meters, and temperature sensing devices.
- Laboratory equipment: pH meters, dissolved oxygen probes, balances, and spectrophotometers

Other Legal Requirements

- State Certification
- Endangered Species Act
- Essential Fish Habitat
- Ocean Discharge Criteria
- Coastal Zone Management Act
- Oil Spill Requirements

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Final Permit Package

- **Fact Sheet**
  - Technical basis for draft permit
- **Response to Comments**
  - Responds to comments received during the comment period
  - Provides the technical basis for any changes from the draft to the final permit
- **Final Permit**
  - Contains the enforceable conditions

Reissuance

- 40 CFR § 122.6 Continuation of expiring permits (administrative extension).
  - the conditions of an expired permit continue in force under 5 USC 558(c) until the effective date of a new permit
    - timely reapplication and
    - EPA did not reissue through no fault of the permittee
- Permit file should contain a letter acknowledging reapplication receipt and extending coverage


Questions